

This Page Is Inserted by IFW Operations
and is not a part of the Official Record

BEST AVAILABLE IMAGES

Defective images within this document are accurate representations of the original documents submitted by the applicant.

Defects in the images may include (but are not limited to):

- BLACK BORDERS
- TEXT CUT OFF AT TOP, BOTTOM OR SIDES
- FADED TEXT
- ILLEGIBLE TEXT
- SKEWED/SLANTED IMAGES
- COLORED PHOTOS
- BLACK OR VERY BLACK AND WHITE DARK PHOTOS
- GRAY SCALE DOCUMENTS

IMAGES ARE BEST AVAILABLE COPY.

**As rescanning documents *will not* correct images,
please do not report the images to the
Image Problem Mailbox.**

REMARKS

The Office Action dated February 17, 2004, has been received and carefully considered. In this response, claims 89-93 have been added, and the specification and claims 23 and 49 have been amended. Entry of added claims 89-93, and the amendments to the specification and claims 23 and 49, is respectfully requested. Reconsideration of the outstanding objections/rejections in the present application is also respectfully requested based on the following remarks.

At the outset, Applicants note with appreciation the indication on page 4 of the Office Action that claims 54, 55, 66, and 67 would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. However, Applicants have opted to defer rewriting the above-identified claims in independent form pending reconsideration of the arguments presented below with respect to the rejected independent claims.

At this point it should be noted that claims 89-93 have been added to cover additional features supported by the specification of the present application.

I. THE OBJECTION TO THE DRAWINGS

On pages 2-3 of the Office Action, the drawings were objected to for having reference numbers not included in the specification.

The specification has been amended to include the reference numbers included in the drawings.

In view of the foregoing, it is respectfully requested that the aforementioned objection to the drawings be withdrawn.

II. THE OBJECTION TO THE SPECIFICATION

On pages 3-4 of the Office Action, the specification was objected to for various informalities, as well as the size of the abstract.

The specification, including the abstract, has been amended to address the concerns of the Examiner.

In view of the foregoing, it is respectfully requested that the aforementioned objection to the specification be withdrawn.

III. THE INDEFINITENESS REJECTION OF CLAIMS 82 AND 88

On pages 5-6 of the Office Action, claims 82 and 88 were rejected under 35 U.S.C. § 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to enable one skilled in the art to make and/or

use the invention. These rejections are hereby respectfully traversed with amendment.

The Examiner asserts that claim 82 is not supported by the specification. The specification has been amended to include direct support for claim 82. In turn, this amendment to the specification derives its support from claim 82. It is respectfully submitted that one of ordinary skill in the art would realize that the transmit repeating pattern may be received in a test receiver separate from the receive circuit when the transmit circuit is operating in a test mode.

The Examiner asserts that claim 88 is not supported by the specification. The specification has been amended to include direct support for claim 88. In turn, this amendment to the specification derives its support from claim 88. It is respectfully submitted that one of ordinary skill in the art would realize that the transmit repeating pattern may be transmitted from a test transmitter separate from the transmit circuit when the receive circuit is operating in a test mode.

In view of the foregoing, it is respectfully requested that the aforementioned indefiniteness rejections of claims 82 and 88 be withdrawn.

IV. THE INDEFINITENESS REJECTION OF CLAIM 23

On page 6 of the Office Action, claim 23 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the invention. This rejection is hereby respectfully traversed with amendment.

The Examiner asserts that claim 23 is unintelligible, thereby making the claim indefinite.

Claim 23 has been amended to address the concerns of the Examiner.

In view of the foregoing, it is respectfully requested that the aforementioned indefiniteness rejection of claim 23 be withdrawn.

V. THE ANTICIPATION REJECTION OF CLAIMS 77-81 AND 83-87

On pages 7-9 of the Office Action, claims 77-81 and 83-87 were rejected under 35 U.S.C. § 102(e) as being anticipated by Johnson et al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Under 35 U.S.C. § 102, the Patent Office bears the burden of presenting at least a prima facie case of anticipation. In re Sun, 31 USPQ2d 1451, 1453 (Fed. Cir. 1993) (unpublished). Anticipation requires that a prior art reference disclose,

either expressly or under the principles of inherency, each and every element of the claimed invention. Id. "In addition, the prior art reference must be enabling." Akzo N.V. v. U.S. International Trade Commission, 808 F.2d 1471, 1479, 1 USPQ2d 1241, 1245 (Fed. Cir. 1986), cert. denied, 482 U.S. 909 (1987). That is, the prior art reference must sufficiently describe the claimed invention so as to have placed the public in possession of it. In re Donohue, 766 F.2d 531, 533, 226 USPQ 619, 621 (Fed. Cir. 1985). "Such possession is effected if one of ordinary skill in the art could have combined the publication's description of the invention with his own knowledge to make the claimed invention." Id.

Regarding claim 77, the Examiner asserts that Johnson et al. teaches a method for operating a transmit circuit as claimed. Specifically, the Examiner asserts that Johnson et al. teaches passing data through the transmit end (FIG. 2, DQ to 51 to 59 to 63 to SRAM) in a normal operating mode, and to provide for evaluation of a digital signal (column 12, lines 5-13 and circuit of FIG. 6) by generating a repeating pattern (FIG. 6 connected to DQ) when in test mode.

However, it is respectfully submitted that the Examiner has failed to address several recited features of claim 77. For instance, claim 77 recites passing data to be transmitted

through the transmit circuit when the transmit circuit is operating in a normal mode. It is respectfully submitted that Johnson et al. does not teach that data to be transmitted is passed through a transmit circuit. Indeed, Figure 2 of Johnson et al., and the path from DQ to 51 to 59 to 63 to 67 to 71 in Figure 2 in particular, shows data being received at an SDRAM module 11 (see column 4, lines 15-53). The data is in fact being transmitted from a memory controller 13 to the SDRAM module 11 (see column 4, lines 54-61).

Claim 77 also recites generating a transmit repeating pattern in the transmit circuit when the transmit circuit is operating in a test mode. It is respectfully submitted that Johnson et al. does not teach that a transmit repeating pattern is generated in the SDRAM module 11. Indeed, the Examiner acknowledges this by asserting that a synchronizing pattern may be generated in the circuit of Figure 6, which is located in the memory controller 13 (see column 5, lines 57-59, and column 9, lines 34-54). Obviously, the SDRAM module 11 and the memory controller 13 are separate and distinct circuits, with one being a transmitter and the other being a receiver. It is respectfully submitted that it is improper to selectively pick and chose separate and distinct portions of Johnson et al. based on hindsight in view of claim 77.

Lastly, claim 77 is directed toward a method for operating a transmit circuit to provide for evaluation of a digital signaling system. In contrast, Johnson et al. is directed (as acknowledged by the Examiner) toward a method of calibrating a data path. It is respectfully submitted that evaluating is different than calibrating, as the former does not necessarily include the latter.

In view of the foregoing, it is respectfully submitted that claim 77 is not anticipated by Johnson et al..

Claims 78-81 are dependent upon independent claim 77. Thus, since independent claim 77 should be allowable as discussed above, claims 78-81 should also be allowable at least by virtue of their dependency on independent claim 77. Moreover, these claims recite additional features which are not claimed, disclosed, or even suggested by the cited references taken either alone or in combination. For example, claim 79 recites uniting a plurality of pipeline structures within the transmit circuit into a transmit repeating pattern generator when the transmit circuit is operating in the test mode. Contrary to the assertions of the Examiner, it is respectfully submitted that the buffer 51, latch 59, and pipeline circuit 63 in Figure 2 of Johnson et al., either with or without the circuit of Figure 6 of Johnson et al., do not teach uniting a

plurality of pipeline structures within the transmit circuit into a transmit repeating pattern generator when the transmit circuit is operating in the test mode. Specifically, the buffer 51, latch 59, and pipeline circuit 63 in Figure 2 of Johnson et al. have nothing to do with generating a transmit repeating pattern, or any type of pattern. Also, claim 80 recites passing distinct data through each of the plurality of pipeline structures when the transmit circuit is operating in the normal mode. Contrary to the assertions of the Examiner, it is respectfully submitted that data does not pass through the circuit of Figure 6 of Johnson et al. (i.e., the circuit that actually generates a synchronization pattern) when either the SDRAM module 11 or the memory controller 13 is operating in a "normal" mode.

Regarding claim 83, the Examiner asserts that Johnson et al. teaches a method for operating a receiver circuit as claimed. Specifically, the Examiner asserts that Johnson et al. teaches passing data through the receive end (FIG. 2, SRAM to 61 to 49 to 47 to DQ) in a normal operating mode, and to provide for generation of a receive repeating pattern (FIG. 8, 107) when in test mode (FIG. 8 connected to DQ).

However, it is respectfully submitted that the Examiner has failed to address several recited features of claim 83. For

instance, claim 83 recites passing receive data through the receive circuit when the receive circuit is operating in a normal mode. Contrary to the assertions of the Examiner, it is respectfully submitted that Figure 2 of Johnson et al., and the path from SRAM to 61 to 49 to 47 to DQ in Figure 2 in particular, shows data being transmitted from an SDRAM module 11 (see column 4, lines 15-46). The data is in fact being received at a memory controller 13 from the SDRAM module 11.

Claim 83 also recites generating a receive repeating pattern in the receive circuit when the receive circuit is operating in a test mode. Since the memory controller 13 is actually acting as a receive circuit in accordance with the reasoning set forth by the Examiner, it is respectfully submitted that Johnson et al. does not teach that a receive repeating pattern is generated in the SDRAM module 11. The Examiner acknowledges this by asserting that a synchronizing pattern may be generated in the circuit of Figure 8, which is located in the control logic circuit 21 of the SDRAM module 11 of Figure 2 (see column 5, lines 59-62). Also, the Examiner incorrectly asserts that the circuit of Figure 8 (i.e., the control logic circuit 21 of the SDRAM module 11 of Figure 2) is connected to the DQ bus in Figure 2. Figure 2 clearly indicates this incorrect assertion.

Lastly, claim 83 is directed toward a method for operating a receive circuit to provide for evaluation of a digital signaling system. In contrast, Johnson et al. is directed (as acknowledged by the Examiner) toward a method of calibrating a data path. It is respectfully submitted that evaluating is different than calibrating, as the former does not necessarily include the latter.

In view of the foregoing, it is respectfully submitted that claim 83 is not anticipated by Johnson et al..

Claims 84-87 are dependent upon independent claim 83. Thus, since independent claim 83 should be allowable as discussed above, claims 84-87 should also be allowable at least by virtue of their dependency on independent claim 83. Moreover, these claims recite additional features which are not claimed, disclosed, or even suggested by the cited references taken either alone or in combination. For example, claim 85 recites uniting a plurality of pipeline structures within the receive circuit into a receive repeating pattern generator when the receive circuit is operating in the test mode. Contrary to the assertions of the Examiner, it is respectfully submitted that the pipeline circuit 61, latch 49, and buffer 47 in Figure 2 of Johnson et al., either with or without the circuit of Figure 8 of Johnson et al., do not teach uniting a plurality of

pipeline structures within the receive circuit into a receive repeating pattern generator when the receive circuit is operating in the test mode. Specifically, the pipeline circuit 61, latch 49, and buffer 47 in Figure 2 of Johnson et al. have nothing to do with generating a receive repeating pattern, or any type of pattern. Also, claim 86 recites passing distinct data through each of the plurality of pipeline structures when the receive circuit is operating in the normal mode. Contrary to the assertions of the Examiner, it is respectfully submitted that data does not pass through the circuit of Figure 8 of Johnson et al. (i.e., the circuit that actually generates a synchronization pattern) when either the SDRAM module 11 or the memory controller 13 is operating in a "normal" mode.

In view of the foregoing, it is respectfully requested that the aforementioned anticipation rejection of claims 77-81 and 83-87 be withdrawn.

VI. THE OBVIOUSNESS REJECTION OF CLAIMS 1, 3, 4, 9, 10, 41 & 46

On pages 10-11 of the Office Action, claims 1, 3, 4, 9, 10, 41, and 46 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847). This rejection is hereby respectfully traversed.

As stated in MPEP § 2143, to establish a prima facie case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991). Also, as stated in MPEP § 2143.01, obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. In re Mills, 916 F.2d 680, 16 USPQ2d 1430 (Fed.

Cir. 1990). Further, as stated in MPEP § 2143.01, to establish *prima facie* obviousness of a claimed invention, all the claim limitations must be taught or suggested by the prior art. In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974). That is, "[a]ll words in a claim must be considered in judging the patentability of that claim against the prior art." In re Wilson, 424 F.2d 1382, 165 USPQ 494, 496 (CCPA 1970). Additionally, as stated in MPEP § 2141.02, a prior art reference must be considered in its entirety, i.e., as a whole, including portions that would lead away from the claimed invention. W.L. Gore & Associates, Inc. v. Garlock, Inc., 721 F.2d 1540, 220 USPQ 303 (Fed. Cir. 1983), cert. denied, 469 U.S. 851 (1984). Finally, if an independent claim is nonobvious under 35 U.S.C. 103, then any claim depending therefrom is nonobvious. In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988).

Regarding claim 1, the Examiner asserts that Gauthier et al. teaches a method of testing a circuit by first generating a repeating transmission pattern, transmitting the pattern to a receiver, generating a receive pattern, and comparing the two patterns (see column 5 lines 23-43). The Examiner acknowledges that Gauthier et al. does not teach the adjustment of a parameter that affects reception of the repeating pattern. However, the Examiner then asserts that Chao et al. does teach

this limitation (see Abstract and column 6 lines 11-55). The Examiner goes on to assert that one with ordinary skill in the art at the time of the invention, motivated by Chao et al., would find it obvious to combine Gauthier et al. and Chao et al. so as to arrive at the claimed invention.

However, it is respectfully submitted that the Examiner has failed to address several recited features of claim 1. For instance, claim 1 recites generating a transmit repeating pattern in a transmit circuit, transmitting the transmit repeating pattern to a receive circuit, generating a receive repeating pattern in the receive circuit, and comparing the transmit repeating pattern to the receive repeating pattern to obtain a comparison. In contrast, it is respectfully submitted that Gauthier et al. does not teach a transmit circuit that generates a transmit pattern and then transmits the transmit pattern to a receive circuit, which generates a receive pattern for comparison with the transmit pattern. That is, it is respectfully submitted that Gauthier et al. merely shows a first LFSR 5 which generates a first pattern that is transmitted to a circuit under test 20 (see column 3, lines 5-24). This circuit under test 20 does not generate a second pattern. Rather, the second pattern is generated by a second LFSR 50 (see column 3, lines 36-37). Granted, the second LFSR 50 does receive an LSB

portion of one word of a "tested" pattern from the circuit under test 20 once during an initialization process (see column 4, lines 44-48). However, this single occurrence of the LSB portion of one word of the "tested" pattern from the circuit under test 20 is certainly not the first pattern from the first LFSR 5.

It is also respectfully submitted that it would not have been obvious to combine Gauthier et al. and Chao et al., and even if they were combined the result would not be the claimed invention. For instance, Gauthier et al. teaches a pass/fail method of testing transmission paths, while Chao et al. teaches a clock varying method of testing I/O circuits. Since Gauthier et al. does not disclose any need for adjusting any parameters in its test method, and Chao et al. does not disclose any need for generating two sets of patterns, there would not have been any reason or motivation to combine Gauthier et al. and Chao et al.. Furthermore, even if Gauthier et al. and Chao et al. were combined, no benefit would be realized from the combination of these two disparate circuits. Indeed, by modifying the test circuit of Gauthier et al. with varying clock signals of Chao et al., one would merely arrive at a pass/fail method of testing transmission paths wherein both first and second patterns are generated with varying clock signals, which would not result in

any benefit and indeed may make the method inoperable.

In view of the foregoing, it is respectfully submitted that claim 1 is not obvious in view of Gauthier et al. and Chao et al..

Claims 3, 4, 9, 10, 41, and 46 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 3, 4, 9, 10, 41, and 46 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 1, 3, 4, 9, 10, 41, and 46 be withdrawn.

VII. THE OBVIOUSNESS REJECTION OF CLAIM 2

On pages 11-12 of the Office Action, claim 2 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Whitworth et al. (U.S. Patent No. 6,331,787). This rejection is hereby respectfully traversed.

Claim 2 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above,

claim 2 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 2 be withdrawn.

VIII. THE OBVIOUSNESS REJECTION OF CLAIMS 5, 14-16, 18 & 19

On page 12 of the Office Action, claims 5, 14-16 18, and 19 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Foland, Jr. et al. (U.S. Patent No. 5,761,212). This rejection is hereby respectfully traversed.

Claims 5, 14-16 18, and 19 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 5, 14-16 18, and 19 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 5, 14-16 18, and 19 be withdrawn.

IX. THE OBVIOUSNESS REJECTION OF CLAIM 17

On pages 12-13 of the Office Action, claim 17 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) in view of Foland, Jr. et al. (U.S. Patent No. 5,761,212) and further in view of Couch (U.S. Patent No. 4,475,210). This rejection is hereby respectfully traversed.

Claim 17 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 17 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 17 be withdrawn.

X. THE OBVIOUSNESS REJECTION OF CLAIM 6

On page 13 of the Office Action, claim 6 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Sakoda et al. (U.S. Patent No. 6,230,022). This rejection is hereby respectfully traversed.

Claim 6 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 6 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 6 be withdrawn.

XI. THE OBVIOUSNESS REJECTION OF CLAIM 7

On pages 13-14 of the Office Action, claim 7 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Terry (U.S. Patent No. 6,055,297). This rejection is hereby respectfully traversed.

Claim 7 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 7 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 7 be withdrawn.

XII. THE OBVIOUSNESS REJECTION OF CLAIM 8

On page 14 of the Office Action, claim 8 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Liao et al. (U.S. Patent No. 6,650,698). This rejection is hereby respectfully traversed.

Claim 8 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 8 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 8 be withdrawn.

XIII. THE OBVIOUSNESS REJECTION OF CLAIMS 11, 31-35, & 38

On pages 14-16 of the Office Action, claims 11, 31-35, and 38 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Maddux et al. (U.S. Patent No. 6,421,801). This rejection is hereby respectfully traversed.

Claims 11, 31-35, and 38 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 11, 31-35, and 38 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 11, 31-35, and 38 be withdrawn.

XIV. THE OBVIOUSNESS REJECTION OF CLAIM 12

On page 16 of the Office Action, claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Prentice (U.S. Patent No. 6,674,998). This rejection is hereby respectfully traversed.

Claim 12 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 12 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 12 be withdrawn.

XV. THE OBVIOUSNESS REJECTION OF CLAIM 13

On pages 16-17 of the Office Action, claim 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Berkovich (U.S. Patent No. 5,369,755). This rejection is hereby respectfully traversed.

Claim 13 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 13 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 13 be withdrawn.

XVI. THE OBVIOUSNESS REJECTION OF CLAIMS 20-22 & 24-30

On page 17 of the Office Action, claims 20-22 and 24-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) in view of Foland, Jr. et al. (U.S. Patent No. 5,761,212) and further in view of Johnson et

al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Claims 20-22 and 24-30 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 20-22 and 24-30 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 20-22 and 24-30 be withdrawn.

XVII. THE OBVIOUSNESS REJECTION OF CLAIM 23

On page 18 of the Office Action, claim 23 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) in view of Foland, Jr. et al. (U.S. Patent No. 5,761,212) and further in view of Komatsu et al. (U.S. Patent No. 6,631,486). This rejection is hereby respectfully traversed.

Claim 23 is dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claim 23 should also be allowable at least by virtue of its dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 23 be withdrawn.

XVIII. THE OBVIOUSNESS REJECTION OF CLAIMS 36 & 37

On page 18 of the Office Action, claims 36 and 37 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Maddux et al. (U.S. Patent No. 6,421,801) and further in view of Johnson et al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Claims 36 and 37 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 36 and 37 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 36 and 37 be withdrawn.

XIX. THE OBVIOUSNESS REJECTION OF CLAIMS 39 & 40

On page 19 of the Office Action, claims 39 and 40 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et

al. (U.S. Patent No. 6,671,847) in view of Foland, Jr. et al. (U.S. Patent No. 5,761,212) and further in view of Sakoda et al. (U.S. Patent No. 6,230,022). This rejection is hereby respectfully traversed.

Claims 39 and 40 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 39 and 40 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 39 and 40 be withdrawn.

XX. THE OBVIOUSNESS REJECTION OF CLAIMS 42 & 43

On page 19 of the Office Action, claims 42 and 43 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Johnson et al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Claims 42 and 43 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 42 and 43 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 42 and 43 be withdrawn.

XXI. THE OBVIOUSNESS REJECTION OF CLAIMS 44, 45, 47, & 48

On pages 20-21 of the Office Action, claims 44, 45, 47, and 48 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gauthier et al. (U.S. Patent No. 5,228,042) in view of Chao et al. (U.S. Patent No. 6,671,847) and further in view of Jalali et al. (U.S. Patent No. 6,154,659). This rejection is hereby respectfully traversed.

Claims 44, 45, 47, and 48 are dependent upon independent claim 1. Thus, since independent claim 1 should be allowable as discussed above, claims 44, 45, 47, and 48 should also be allowable at least by virtue of their dependency on independent claim 1.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 44, 45, 47, and 48 be withdrawn.

XXII. THE OBVIOUSNESS REJECTION OF CLAIMS 49-53 & 56

On pages 21-22 of the Office Action, claims 49-53 and 56 were rejected under 35 U.S.C. § 103(a) as being unpatentable

over Gerowitz et al. (U.S. Patent No. 6,222,380) in view of Gauthier et al. (U.S. Patent No. 5,228,042). This rejection is hereby respectfully traversed.

Regarding claim 49, the Examiner asserts that Gerowitz et al. teaches a transmit data storage element (FIG. 2, L1, L2, L3, L4) adapted to receive data from a transmit data input (FIG. 2, DO, D1, D2, D3) to be sequentially transmitted as transmit data out when operating in normal mode (FIG. 2, Q). The Examiner acknowledges that Gerowitz et al. does not teach a repeating pattern in a test mode. However, the Examiner then asserts that Gauthier et al. does teach providing a repeating pattern (FIG. 1, 5) in a test mode (FIG. 1, Control Circuit 30) and transmitting the data out. The Examiner goes on to assert that by joining the multiplexers of the two references (Gauthier et al., FIG. 1, 15 and Gerowitz et al., FIG. 2, 21), one would have a data storage element consisting of both latches (in Gerowitz et al.), and a shift register (in Gauthier et al.), and one would be able to provide a sequentially transmitted repeating pattern in test mode, or normal data when not in test mode. The Examiner also goes on to assert that Gauthier et al. (in column 1, lines 43-52) states as an advantage an improved method and circuit for test, utilizing less test hardware memory. The Examiner further goes on to assert that one with ordinary skill

in the art at the time of the invention, motivated as indicated by Gauthier et al., would find it obvious to combine Gerowitz et al. and Gauthier et al. so as to arrive at the claimed invention.

However, it is respectfully submitted that Gerowitz et al. does not teach a transmit data storage element adapted to receive data from a transmit data input and sequentially transmit a transmit data output signal when the transmit circuit is operating in a normal mode, as presently claimed. That is, the latches (L1, L2, L3, & L4) in Figure 2 of Gerowitz et al. do not both receive data from a transmit data input and sequentially transmit a transmit data output signal. Rather, the latches (L1, L2, L3, & L4) in Figure 2 of Gerowitz et al. merely latch parallel data, and then output this same parallel data. It is respectfully submitted that this latching and subsequent outputting of parallel data does not teach sequentially transmit a transmit data output signal, as claimed.

Also, it is respectfully submitted that it would not have been obvious to combine Gerowitz et al. and Gauthier et al., and even if they were combined the result would not be the claimed invention. For instance, Gerowitz et al. teaches a high speed parallel/serial link for data communication, which does not include or even suggest a mode or mechanism for testing the

link. In contrast, Gauthier et al. teaches a pass/fail method of testing transmission paths, wherein data is not converted from parallel to serial, or vice versa. Since Gerowitz et al. does not disclose any need or interest in testing its link, but rather is mainly interested in parallel to serial conversion and reducing pin count, and Gauthier et al. is only interested in transmission path testing, with no parallel to serial conversion and no apparent regard for pin count, it is respectfully submitted that there would not have been any reason or motivation to combine Gerowitz et al. and Gauthier et al..

Furthermore, even if Gerowitz et al. and Gauthier et al. were combined, no benefit would be realized from the combination of these two disparate circuits. For instance, the Examiner asserts that combining the multiplexer 21 in Gerowitz et al. with the multiplexer 15 in Gauthier et al. would result in a data storage element having both latches (in Gerowitz et al.) and a shift register (in Gauthier et al.) for providing a sequentially transmitted repeating pattern in test mode, or normal data when not in test mode. However, Applicants respectfully disagree for several reasons. First of all, claim 49 recites that a transmit data storage element (i.e., not two transmit data storage elements formed from latches in Gerowitz et al. and a shift register in Gauthier et al.) is operative in

both a normal mode and a test mode. Secondly, as discussed above, the latches in Gerowitz et al. do not sequentially transmit a transmit data output signal. Thirdly, the multiplexer 21 in Gerowitz et al. differs from the multiplexer 15 in Gauthier et al. in that the multiplexer 21 in Gerowitz et al. operates to multiplex parallel input data into serial output data while the multiplexer 15 in Gauthier et al. operates to select between test data and normal data, with no parallel to serial conversion. Thus, the combination of the multiplexer 21 in Gerowitz et al. and the multiplexer 15 in Gauthier et al. would not result in any benefit and indeed may make a resulting circuit inoperable.

In view of the foregoing, it is respectfully submitted that claim 49 is not obvious in view of Gerowitz et al. and Gauthier et al..

Claims 50-53 and 56 are dependent upon independent claim 49. Thus, since independent claim 49 should be allowable as discussed above, claims 50-53 and 56 should also be allowable at least by virtue of their dependency on independent claim 49.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 49-53 and 56 be withdrawn.

XXIII. THE OBVIOUSNESS REJECTION OF CLAIM 57

On pages 22-23 of the Office Action, claim 57 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerowitz et al. (U.S. Patent No. 6,222,380) in view of Gauthier et al. (U.S. Patent No. 5,228,042) and further in view of applicant's admitted prior art. This rejection is hereby respectfully traversed.

Claim 57 is dependent upon independent claim 49. Thus, since independent claim 49 should be allowable as discussed above, claim 57 should also be allowable at least by virtue of its dependency on independent claim 49.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 57 be withdrawn.

XXIV. THE OBVIOUSNESS REJECTION OF CLAIM 58

On page 23 of the Office Action, claim 58 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerowitz et al. (U.S. Patent No. 6,222,380) in view of Gauthier et al. (U.S. Patent No. 5,228,042) and further in view of Jalali et al. (U.S. Patent No. 6,154,659). This rejection is hereby respectfully traversed.

Claim 58 is dependent upon independent claim 49. Thus, since independent claim 49 should be allowable as discussed above, claim 58 should also be allowable at least by virtue of its dependency on independent claim 49.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 58 be withdrawn.

XXV. THE OBVIOUSNESS REJECTION OF CLAIM 59

On page 23 of the Office Action, claim 59 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerowitz et al. (U.S. Patent No. 6,222,380) in view of Gauthier et al. (U.S. Patent No. 5,228,042) in view of Jalali et al. (U.S. Patent No. 6,154,659) and further in view of Johnson et al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Claim 59 is dependent upon independent claim 49. Thus, since independent claim 49 should be allowable as discussed above, claim 59 should also be allowable at least by virtue of its dependency on independent claim 49.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 59 be withdrawn.

XXVI. THE OBVIOUSNESS REJECTION OF CLAIM 60

On pages 23-24 of the Office Action, claim 60 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Gerowitz et al. (U.S. Patent No. 6,222,380) in view of Gauthier et al. (U.S. Patent No. 5,228,042) in view of Jalali et al. (U.S. Patent No. 6,154,659) in view of Johnson et al. (U.S. Patent No. 6,606,041) and further in view of Chen (U.S. Patent No. 6,003,118). This rejection is hereby respectfully traversed.

Claim 60 is dependent upon independent claim 49. Thus, since independent claim 49 should be allowable as discussed above, claim 60 should also be allowable at least by virtue of its dependency on independent claim 49.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 60 be withdrawn.

XXVII. THE OBVIOUSNESS REJECTION OF CLAIMS 61-65, 68, & 70

On pages 24-26 of the Office Action, claims 61-65, 68, and 70 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Koga (U.S. Patent No. 6,339,387) in view of Gauthier et al. (U.S. Patent No. 5,228,042). This rejection is hereby respectfully traversed.

Regarding claim 61, the Examiner asserts that Koga teaches a receive data storage element (FIG. 1, C8, C9, C10, C7) adapted to output data from a receive data input (FIG. 1, DATA) when operating in normal mode. The Examiner acknowledges that Koga does not teach a comparison element in a test mode. However, the Examiner then asserts that Gauthier et al. does teach providing a comparison element (FIG. 1, 60) in a test mode (FIG. 1, Control Circuit 30), comparing the received with the expected producing an output signal (FIG. 1, 62). The Examiner goes on to assert that by joining the two references (Gauthier et al., FIG. 1, 21 and Koga, FIG. 1, DATA), one would have a data storage element consisting of both latches (in Koga) and a shift register (in Gauthier et al.), and one would be able to evaluate a transmitted repeating pattern in test mode, or normal data when not in test mode. The Examiner also goes on to assert that Gauthier et al. (in column 1, lines 43-52) states as an advantage an improved method and circuit for test, utilizing less test hardware memory. The Examiner further goes on to assert that one with ordinary skill in the art at the time of the invention, motivated as indicated by Gauthier et al., would find it obvious to combine Koga and Gauthier et al. so as to arrive at the claimed invention.

However, it is respectfully submitted that it would not

have been obvious to combine Koga and Gauthier et al., and even if they were combined the result would not be the claimed invention. For instance, Koga teaches a serial to parallel converter, but does not include or even suggest a mode or mechanism for testing the conversion. In contrast, Gauthier et al. teaches a pass/fail method of testing transmission paths, wherein data is not converted from serial to parallel, or vice versa. Since Koga is only interested in serial to parallel conversion and does not disclose any need or interest in the testing of same, and Gauthier et al. is only interested in transmission path testing, with no serial to parallel conversion, it is respectfully submitted that there would not have been any reason or motivation to combine Koga and Gauthier et al..

Furthermore, even if Koga and Gauthier et al. were combined, no benefit would be realized from the combination of these two disparate circuits. For instance, the Examiner asserts that combining Koga with Gauthier et al. would result in a data storage element having both latches (in Koga) and a shift register (in Gauthier et al.) for evaluating a transmitted repeating pattern in test mode, or normal data when not in test mode. However, Applicants respectfully disagree for multiple reasons. First of all, claim 61 recites that a receive data

storage element (i.e., not two receive data storage elements formed from latches in Koga and a shift register in Gauthier et al.) is operative in both a normal mode and a test mode. Secondly, as discussed above, Koga is directed toward serial to parallel conversion, while Gauthier et al. does not teach or even suggest such a conversion. Thus, the combination of Koga and Gauthier et al. would not result in any benefit and indeed may make a resulting circuit inoperable.

In view of the foregoing, it is respectfully submitted that claim 61 is not obvious in view of Koga and Gauthier et al..

Claims 62-65, 68, and 70 are dependent upon independent claim 61. Thus, since independent claim 61 should be allowable as discussed above, claims 62-65, 68, and 70 should also be allowable at least by virtue of their dependency on independent claim 61.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 61-65, 68, and 70 be withdrawn.

XXVIII. THE OBVIOUSNESS REJECTION OF CLAIM 69

On page 26 of the Office Action, claim 69 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Koga (U.S. Patent No. 6,339,387) in view of Gauthier et al. (U.S. Patent

No. 5,228,042) and further in view of Johnson et al. (U.S. Patent No. 6,606,041). This rejection is hereby respectfully traversed.

Claim 69 is dependent upon independent claim 61. Thus, since independent claim 61 should be allowable as discussed above, claim 69 should also be allowable at least by virtue of its dependency on independent claim 61.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claim 69 be withdrawn.

XXIX. THE OBVIOUSNESS REJECTION OF CLAIMS 71-74

On pages 26-28 of the Office Action, claims 71-74 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Koga (U.S. Patent No. 6,339,387) in view of Gauthier et al. (U.S. Patent No. 5,228,042) and further in view of Maddux et al. (U.S. Patent No. 6,421,801). This rejection is hereby respectfully traversed.

Claims 71-74 are dependent upon independent claim 61. Thus, since independent claim 61 should be allowable as discussed above, claims 71-74 should also be allowable at least by virtue of their dependency on independent claim 61.

In view of the foregoing, it is respectfully requested that the aforementioned obviousness rejection of claims 71-74 be withdrawn.

XXX. CONCLUSION

In view of the foregoing, it is respectfully submitted that the present application is in condition for allowance, and an early indication of the same is courteously solicited. The Examiner is respectfully requested to contact the undersigned by telephone at the below listed telephone number, in order to expedite resolution of any issues and to expedite passage of the present application to issue, if any comments, questions, or suggestions arise in connection with the present application.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made.

Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account No. 50-0206, and please credit any excess fees to the same deposit account.

Patent Application
Attorney Docket No.: 57941.000041
Client Reference No.: RA208.CIP1.US

Respectfully submitted,

Hunton & Williams LLP

By: 

Thomas E. Anderson
Registration No. 37,063

TEA/vrp

Hunton & Williams LLP
1900 K Street, N.W.
Washington, D.C. 20006-1109
Telephone: (202) 955-1500
Facsimile: (202) 778-2201

Date: May 17, 2004